



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/US98/11884 <b>(22) International Filing Date:</b> 10 June 1998 (10.06.98)  <b>(30) Priority Data:</b> 08/874,080                      12 June 1997 (12.06.97)                      US  <b>(71) Applicant:</b> INTERFACE, INC. [US/US]; Suite 2000, 2859 Paces Ferry Road, Atlanta, GA 30339 (US).  <b>(72) Inventor:</b> MASHBURN, Laurence, Eugene; 2101 Mill Creek Road, Rock Face, GA 30740 (US).  <b>(74) Agents:</b> PRATT, John, S. et al.; Kilpatrick & Stockton, Suite 2800, 1100 Peachtree Street, Atlanta, GA 30309-4530 (US).		<b>(81) Designated States:</b> AU, BR, CA, CN, JP, KR, MX, Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i>
<b>(54) Title:</b> NON-WOVEN ADHESIVE RELEASE LAYER FOR CARPET AND CARPET TILE  <b>(57) Abstract</b>  Carpet or carpet tile having a yarn pile or other face layer, intermediate backing structure below the face material, a pressure sensitive adhesive layer, and a layer of non-woven fabric, such as spunbonded polypropylene fabric, adhered to the pressure sensitive adhesive as a "peel and stick" release layer that may also be left in place during installation.		

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**NON-WOVEN ADHESIVE RELEASE LAYER  
FOR CARPET AND CARPET TILE**

**FIELD OF THE INVENTION**

This invention relates to carpet and carpet tile and to release layers applied to  
5 adhesive on the underside of "peel and stick" carpet and carpet tile.

**BACKGROUND OF THE INVENTION**

Carpet and carpet tile have long been adhesively bonded to floors in some  
installations and, in some instances, to other materials that are, in turn, bonded to the  
10 floor.

A number of approaches have been utilized for temporarily and permanently  
15 adhesively bonding carpet and carpet tile to the floor on which it is used. Among those  
approaches are the application of adhesive to the floor surface before positioning the  
carpet product on the floor surface, the application of adhesive to the underside of the  
carpet product before positioning it on the floor surface, and the interposition of an  
adhesive-carrying layer between the underside of the carpet product and the floor  
15 surface, such as the grid-like frame bearing pressure sensitive adhesive described in  
U.S. Patent No. 4,234,649 to Ward. The application of pressure sensitive adhesive to  
the underside of the carpet product presents a number of advantages including making  
installation easier by avoiding the need to apply adhesive to the floor. One of the best  
20 approaches involves application of pressure sensitive adhesive to the underside of  
carpet products during the manufacturing process so that no adhesive application is  
necessary during installation.

The principal drawback associated with the application of pressure sensitive  
adhesive during manufacture is the need to keep the adhesive layer protected and clean  
25 so that the adhesive sticks only to desired materials. This is normally accomplished by  
the application to the adhesive layer, during manufacture, of a protective film or  
"release" layer that can be removed immediately prior to the installation of the carpet  
product and then discarded. Because they are thin, relatively inexpensive and widely  
available, polyethylene films are widely used in such applications, as well as in  
30 numerous other instances where pressure sensitive adhesive is used. The same

considerations have resulted in use of other films and of coated and other paper release layers, such as "kraft" paper.

Film and paper release layers are disclosed, for instance, in U.S. Patent No. 4,242,389 to Howell, U.S. Patent No. 3,010,859 to Stephens et al. and U.S. Patent No. 3,014,829 to Curtin.

Substantial problems are associated with the use of polyethylene and other film or kraft paper as a release layer. During the course of installation of carpet or carpet tile, the release layer must be removed and handled and ultimately disposed of. Polyethylene and other films and kraft paper are bulky after removal because they will not easily compress into a small volume of space. As a result, they are constantly in the installer's way during installation and present significant ultimate disposal problems. There are also challenges associated with recycling such materials. Another significant feature of such prior art release films and layers is that they must be removed during the course of installation; the carpet products cannot be installed with the release layer left in place.

### SUMMARY OF THE INVENTION

The present invention is a carpet or carpet tile product having a yarn pile or other face layer, intermediate backing structure below the face material, a pressure sensitive adhesive layer, and a layer of non-woven material adhered to the pressure sensitive adhesive. This non-woven material typically acts as a release layer and is advantageous as such because it can be wadded, folded or otherwise compressed into a very small volume. This avoids handling problems associated with dealing with conventional release layers during installation, makes it easy to transport the removed release layer away from installation sites and makes it easy to dispose of or recycle the release layer. Significantly, use of the non-woven layer of the present invention gives the carpet product a supple "hand," thereby facilitating installation.

Furthermore, the non-woven "release" layer of the present invention can be left in place as the bottom-most layer of the carpet product where it is desired to install the product without use of adhesive or is desirable to utilize separate adhesive applied at

the time of installation to the bottom-most surface of the carpet product or, more typically, to the floor.

While a variety of materials can be used as the release layer of present invention, a material found to be particularly appropriate for this application is spunbonded non-woven polypropylene fabric. The release layer of the present invention normally will be applied as a single piece of fabric on carpet tile. Similarly, the layer can also be applied in a single piece spanning the width of broadloom or roll goods, whether six feet wide, twelve feet wide or other widths. For ease of handling and removal during installation, however, it may be preferable to apply the release layer to roll goods in less than full width, such as in thirty (30) inch widths. A multi-piece release layer may also be desirable on carpet tiles to facilitate removal.

#### BRIEF DESCRIPTION OF THE FIGURE

The figure is a perspective view showing the top and one turned-up corner of the carpet or carpet tile of the present invention using the non-woven fabric release layer of the present invention.

#### DETAILED DESCRIPTION OF THE FIGURE

The figure illustrates a piece of carpet or carpet tile 10 of the present invention. Carpet 10 includes an upper or "face" structure made of nylon, wool or other natural or synthetic yarn pile or other material 12 that is bonded, fused, stitched, needled, needle punched, tufted woven or otherwise attached to backing structure 14.

Backing structure 14 may include primary and secondary backing and may utilize stiffing and stabilizing layers of fiberglass or other materials and may incorporate a wide variety of additional materials and components, including, among others, polyvinyl chloride, polypropylene, polyurethane, bitumen, fillers, fire retardants and smoke suppressants.

A layer of pressure sensitive adhesive 16 is applied to the underside of backing structure 14. Usable adhesives include, among others, Rohm and Haas Rhoplex N-619, a thermoplastic acrylic emulsion adhesive. As will be understood by those skilled in

the art, numerous other solvent-based and latex emulsion adhesives can be used that will provide acceptable adhesion between backing 14 and the floor on which the carpet 10 is to be installed.

5 Release layer 18, shown partially peeled away from adhesive 16 in the figure, is applied to the underside of pressure sensitive adhesive 16. While layer 18 of the present invention is generally referred to here as a "release layer," it should be understood that layer 18 is not in all installations removed from the pressure sensitive adhesive 16 of carpet product 10, in which instances it does not actually serve a "release" function.

10 In the illustrated embodiment of the present invention, the material for release layer 18 is spunbonded non-woven polypropylene fabric having a weight of approximately four ounces per square yard, which may be white in color. Lighter and heavier weights of release layer 18 can also be used depending on the application, including weights as low as 0.75 ounces per square yard, although weights less than 15 about two ounces per square yard may be susceptible to tearing when the release layer is removed. Heavier weights also may be used. Other colors than white, including black in particular, may also, of course, be used.

Spunbonded non-woven polypropylene fabric useable for the release layer of present invention is available from Poly-Bond Incorporated, 1020 Shenandoah Village 20 Drive, Waynesboro, Virginia 22980. Spunbonded non-woven polypropylene fabric provided by Poly-Bond Incorporated is available with an anti-static material added.

Other fibrous fabrics can also be utilized as release layer 18 in accordance with the present invention, provided that they exhibit an acceptable balance of desirable characteristics similar to those exhibited by the above-described spunbonded non- 25 woven polypropylene fabric. Those characteristics include economy, ease of release from adhesive 16 (without, for instance, unduly tearing or pulling apart and without leaving fibers adhered to adhesive 16), ease of handling after removal from adhesive 16, recyclability and agreeable "hand." Accordingly, fabrics formed not only from polypropylene but also from other synthetic and natural fibers and blends of fibers by

spunbonding, needling, knitting, weaving and other techniques may be usable as release layer 18.

In order to install carpet 10 in a typical glue-down installation, release layer 18 is removed and carpet 10 is positioned in the desired location with pressure sensitive  
5 adhesive 16 contacting the underlying floor structure.

Alternatively, in some installations it maybe desirable to leave release layer 18 in place and "loose lay" carpet 10 on the floor without adhesive contact with the floor or by interposing adhesive between the floor and release layer 18.

CLAIMS:

1           1.     A carpet product, comprising carpet face material, backing having an  
2 underside, pressure sensitive adhesive positioned on the underside of the backing, and a  
3 release layer of fabric applied to the pressure sensitive adhesive.

2.     The carpet product of claim 1, wherein the fabric is non-woven fabric.

1           3.     The carpet product of claim 2, wherein the non-woven fabric is  
2 spunbonded fabric made of substantially polypropylene fibers.

4.     The carpet product of claim 2, wherein the carpet product is a carpet tile.

1           5.     The carpet product of claim 2, wherein the carpet product is broadloom  
2 carpet.

1           6.     The carpet product of claim 2, wherein the release layer comprises  
2 multiple, side by side sheets of fabric.

1           7.     A carpet product, comprising carpet face yarn secured to carpet backing  
2 structure having an underside, pressure sensitive adhesive positioned on the underside  
3 of the carpet backing structure, and, adhered to the adhesive, polypropylene  
4 spunbonded release fabric weighing approximately one ounce per square yard.

1           8.     Carpet tile, comprising nylon face yarn tufted into a primary backing,  
2 secondary backing having an underside secured to the secondary backing, adhesive  
3 applied to the underside of the secondary backing, and, adhered to the adhesive, non-  
4 woven fabric release material.

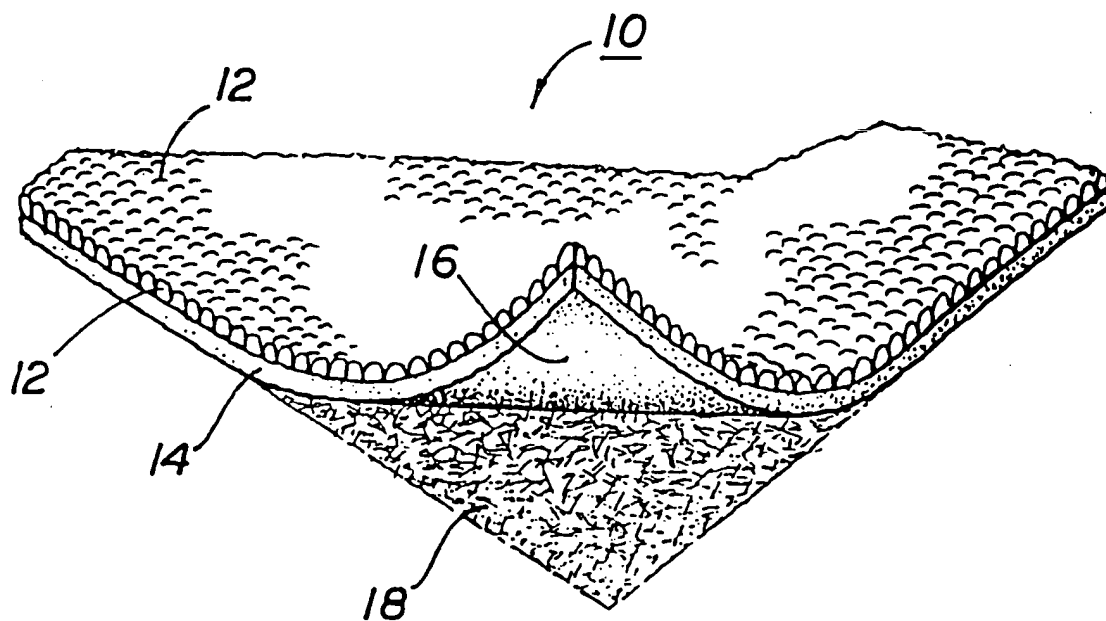
1           9.     The carpet tile of claim 8, wherein the release material is spunbonded  
2 non-woven fabric.



1           10. The carpet tile of claim 8, wherein the release fabric weighs no more than  
2 approximately one ounce per square yard.

1           11. The carpet tile of claim 9, wherein the adhesive is applied as a  
2 thermoplastic acrylic emulsion

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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 98/11884

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 D06N7/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 D06N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CH 456 020 A (BREVETEX, S.A.) 15 July 1968 see column 3, line 51 - line 63; claim 1; figure 1 see column 4, line 24 - line 32 ---	1,2
X	WO 92 02163 A (CYRUS MFG INC) 20 February 1992 see page 3, line 34 - page 4, line 12; claim 1; figures 1,2,5 ---	1-4
X	DE 26 04 258 A (LAESSER AG WALTHER) 8 June 1977 see the whole document ---	1,2,4
A	DE 94 03 111 U (WUDECO BELAEGE GMBH) 23 June 1994 see the whole document ---	1,2,4,8, 11
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

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# INTERNATIONAL SEARCH REPORT

Int'l Application No

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>DE 93 14 788 U (LONGLIFE TEPPICHBODEN BERNDT C) 2 February 1995 see the whole document -----</p>	<p>1-4,8,10</p>

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 98/11884

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CH 456020 A		CH 14266 A	
WO 9202163 A	20-02-1992	CA 2087594 A,C	28-01-1992
		US 5683780 A	04-11-1997
		AU 651558 B	28-07-1994
		DE 69022602 D	26-10-1995
		EP 0541531 A	19-05-1993
DE 2604258 A	08-06-1977	CH 593405 A	30-11-1977
DE 9403111 U	23-06-1994	NONE	
DE 9314788 U	02-02-1995	NONE	